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Abstract: In 2001, the International Whooping Crane Recovery Team and the Whooping Crane Health Advisory Team re-emphasized the need for analysis of embryonic deaths within captive breeding flocks to identify preventable deaths and promote increased production of chicks for release programs. We conducted a retrospective study of egg necropsy reports to identify causes of death among developing whooping crane (*Grus americana*) embryos from captivity. Records from 44 egg necropsies conducted at the International Crane Foundation (ICF) between 2001 and 2008 were reviewed. The eggs were of captive origin (ICF, $n = 40$; Patuxent Wildlife Research Center, $n = 3$; Calgary Zoo, $n = 1$). All necropsies included gross examinations; few were amenable to histopathological analysis due to advanced autolysis. The primary causes of death included embryo malposition ($n = 7$, 16%), hemorrhage/trauma ($n = 7$, 16%), natural incubation failure ($n = 5$, 11%), artificial incubation failure ($n = 4$, 9%), and miscellaneous ($n = 2$, 5%). Many of the necropsies did not reveal a specific cause of death ($n = 19$; 43%). Most of the embryos ($n = 24$, 54%) died in the last third of incubation. The most common cause of death in late stage embryos was malpositioning (29% of late stage embryonic deaths). Unfortunately, our study did not reveal many preventable conditions that would boost hatchability if corrected. The underlying causes of malpositioning are difficult to discern, as turning rates, position and nest environment may vary between the different species and individual cranes used to incubate whooping crane eggs at ICF. The occurrence of hemorrhage or traumatic membrane rupture is likely caused by mechanical stress to the eggs despite the great care of handlers to avoid injury. On a positive note, infectious disease does not appear to be a risk factor for embryonic mortality in captive whooping cranes at ICF.

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Key words: cranes, embryo, Gruidae, *Grus americana*, malposition, mortality.